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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/018,957	12/27/2001	Christopher C. Davis	1797.0360001	6050
26111	7590	11/29/2005	EXAMINER	
STERNE, KESSLER, GOLDSTEIN & FOX PLLC 1100 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			BELLO, AGUSTIN	
			ART UNIT	PAPER NUMBER
			2633	

DATE MAILED: 11/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/018,957

Applicant(s)

DAVIS, CHRISTOPHER C.

Examiner

Agustin Bello

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5 and 7-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5 and 7-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/19/05 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 10 recites the limitation "the optical characteristic" in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 1, 3-5, and 7-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamori (U.S. Patent No. 6,278,537) in view of Bozzay (U.S. Patent No. 6,043,918).

Regarding claims 1, 5, and 9, Miyamori teaches a method for optical wireless communication, comprising the steps of receiving a source data signal (reference numeral S11 in Figure 3) having data; creating a set of temporally distinguishable transmission signals (e.g. S11 and S12 in Figure 3) the temporally distinguishable transmission signals being temporally separated from each other, such that a first temporally distinguishable transmission signal is temporally distinguished from a second temporally distinguishable transmission signal by a time-delay (inherent in time-delayed signals taught by Miyamori); converting (via reference numeral 106 in Figure 3) the set of temporally distinguishable transmission signals to obtain corresponding a set of temporally and optically distinguishable light signals, each light signal having a modulation representation of the data from the same data signal and a respective optical characteristic (e.g. the 90 degree phase difference between the two carrier signals created by the DQPSK modulation of the system, column 5 lines 26-34), and transmitting the set of temporally and optically distinguishable light signals in a single output transmission beam (reference numeral L01 in Figure 3) through a turbulent medium (e.g. air between reference numerals 106 and 151 in Figure 3), whereby the set of light signals can pass through uncorrelated channels in turbulent medium (reference numeral L01 in Figure 3). Miyamori differs from the claimed invention in that Miyamori fails to specifically teach that the optical signals are transmitted through the Earth's atmosphere wherein the duration of the time-delay is set based on characteristics of atmospheric turbulence to reduce bit errors in the transmitted temporally and optically distinguishable signals. However, given that the Earth's atmosphere encompasses the

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whole mass of air surrounding the earth, it stands to argue that Miyamori at minimum suggests that the optical signals of the system are transmitted through the Earth's atmosphere.

Furthermore, Bozzay, in the same field of free-space optical communication, teaches transmission of temporally distinguishable optical signals through the Earth's atmosphere and further teaches basing a time-delay between signals on characteristics of atmospheric turbulence (e.g. scintillation) to reduce bit errors in the transmitted temporally and optically distinguishable signals. One skilled in the art would have been motivated to base the time-delay between signals on characteristics of atmospheric turbulence in order to provide an affordable solution in the optical free-space communication domain (column 2 lines 6-14 of Bozzay). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to transmit the optical signals through the Earth's atmosphere as suggested by Miyamori and taught by Bozzay, wherein the duration of the time-delay is set based on characteristics of atmospheric turbulence to reduce bit errors in the transmitted temporally and optically distinguishable signals as taught by Bozzay.

Regarding claims 3 and 7, Miyamori teaches a set of delayed, diverse light signals (e.g. S11 and S12 in Figure 3), and wherein: said creating step comprises the steps of creating at least one duplicate of the source data signal (e.g. input to reference numeral 101 in Figure 3) and delaying the created duplicate signal (via reference numeral 101 in Figure 3) to obtain the set of temporally distinguishable transmission signals having a non-delayed transmission signal and at least one delayed transmission signal (e.g. S11 and S12 in Figure 3); and said converting step (via reference numeral 106 in Figure 3) comprises the step of generating a set of delayed, diverse light signals in response to the set of temporally distinguishable transmission signals, wherein the

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set of delayed, diverse light signals includes a first light signal corresponding to the non-delayed transmission signal and at least a second light signal corresponding to the at least one delayed transmission signal.

Regarding claims 4 and 8, Miyamori teaches receiving (reference numeral 151 in Figure 3) the single output transmission beam after it passes through the turbulent medium (reference numeral L01 in Figure 3), detecting temporally distinguishable light signals within the received single output transmission beam to obtain corresponding temporally distinguishable data signals (e.g. S15 and S16 in Figure 3); temporally adjusting at least the first temporally distinguishable data signal obtained in said detecting step (reference numeral 156 in Figure 3); and logically evaluating each successive bit (reference numeral 157 in Figure 3) in the first temporally adjusted temporally distinguishable data signal with a corresponding successive bit in the second temporally distinguishable data signal to obtain each successive output bit in a single output data signal (reference numeral S19 in Figure 3).

Regarding claim 11-13, the combination of Miyamori and Bozzay teaches that the duration of the time delay is less than approximately 10 milliseconds (column 2 lines 6-7 of Bozzay).

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamori (U.S. Patent No. 6,278,537) in view of Bozzay (U.S. Patent No. 6,043,918), Britz (U.S. Patent No. 6,122,084), and Scheps (U.S. Patent No. 6,137,609).

Regarding claim 10, Miyamori teaches a receiver (reference numeral 151-155 in Figure 3 of Miyamori) that receives the single output beam after it is transmitted through the turbulent medium and at least one receiver-data-delay device (reference numeral 156 in Figure 3) that

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temporally aligns the received-set of temporally distinguishable data signals, thereby producing a final set of data signals, and a logic gate (reference numeral 157 in Figure 3) that receives the final set of data signals and logically evaluates (i) each successive bit in a first data signal in the final set of data signals and (ii) a corresponding successive bit in a second data signal in the final set of data signals to produce each successive bit of an output data signal.

Miyamori differs from the claimed invention in that Miyamori fails to specifically teach that the receiver comprises at least one optical-signal-separating device that separates the single output beam, based on the optical characteristic, into a second set of temporally distinguishable optical signals, differences between respective optical signals in the second set of temporally distinguishable optical signals and corresponding optical signals in the first set of temporally distinguishable optical signals being due to fading caused by the Earth's atmosphere. However, Britz teaches such a configuration (Figure 5B). One skilled in the art would have been motivated to employ a splitting system such as that taught by Britz in order to direct different beams to different receivers (column 6 lines 65-66 of Britz). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to include a splitting system such as that taught by Britz in the device of Miyamori.

Miyamori further differs from the claimed invention in that Miyamori fails to specifically teach a set of detectors, each detector configured to receive a respective optical signal from the second set of temporally distinguishable optical signals and convert the respective optical signal into a received data signal, thereby producing a received-set of temporally distinguishable data signals. However, Scheps teaches such a configuration (Figure 2B). One skilled in the art would have been motivated to employ a detector configuration such as that taught by Scheps in order to

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allow a plurality of beams to be detected simultaneously. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to include a detector configuration as taught by Scheps in the device of Miyamori.

As discussed above, the configuration claimed is well known in the art and one skilled in the art in appreciating the teachings of Britz and Scheps would have recognized the advantages of applying those teachings to a system such as that taught by Miyamori.

Response to Arguments


8. Applicant's arguments with respect to claim 9/19/05 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


AGUSTIN BELLO
PRIMARY EXAMINER